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*University of Westminster, Coat of Arms*

## GoalMind

### **A Neural Network based Football Player Position Predictor**

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## **Abstract**

The problem addressed in this research is the subjectivity and time-consuming process of assigning soccer player positions based on coaches' personal observations and experiences. This can lead to inconsistencies in position assignments and can be a significant burden on coaches handling large numbers of players. The research aims to design, develop, and evaluate an automated recommendation system for soccer player positions based on physical, performance, technical, and mental attributes, to make the process faster, easier, and more accurate, and to reduce the workload for coaches, managers, and scouts.

To address this problem, the researchers developed a neural network-based solution using a Multi-Layer Perceptron (MLP) classifier model, a type of feedforward neural network, to predict the position of a football player based on their attributes. The researchers conducted experiments using grid search and random search techniques to optimize the model's performance by exploring different MLP architectures and hyperparameters.

The evaluation of the proposed neural network model was performed using the FIFA 22 dataset, where it outperformed other traditional machine learning models such as Random Forest, Gradient Boosting, XGBoost, Linear Regression, Decision Tree, and Naive Bayes, achieving an accuracy of 84%. The research demonstrates the effectiveness of neural network-based models in solving football player position prediction problems and highlights their potential to contribute to the field of football and other sports analytics.

**Subject Descriptors:** Multi-Class Classification

**Keywords:** Football Player Position Requirements, Football Player Position Prediction, Physical, Technical, Mental Characteristics, Feedforward Neural Networks, Classification Model, XGBoost